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## ENGINEERING DATA TRANSMITTAL

Page 1 of 1

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1	1	Cog. Mgr.	R. D. Fox	10/15/92	H6-07	ERC (1)			
			R. D. Fox						
		Safety							
		Env.							

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7. Abstract This document presents a unified view of the Environmental Restoration Technical Information Generation and Management Process. It provides a description of the processes involved in ER Technical Information Management. The scope of this document is limited to outlining the remediation work, identifying the major classes of documents generated during the process of characterizing the sites, and providing an overview of how data, records and documents are managed to meet CERCLA, RCRA and TPA requirements and milestones.		
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ENVIRONMENTAL RESTORATION TECHNICAL INFORMATION  
GENERATION AND MANAGEMENT PROCESS

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# ABBREVIATIONS AND ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirements
CA	Cost Analysis
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CLP	Contract Laboratory Program
CRP	Community Relations Plan
DMP	Data Management Plan
DOE	U.S. Department of Energy
EDMC	Environmental Data Management Center
EE	Engineering Estimate
EE&G	Environmental Engineering & Geotechnology
EFS	Environmental Field Services
ER	Environmental Restoration and Remediation
FAST	Function Analysis System Technique
FFC	Field File Custodian
GG	Geosciences Group
HEIS	Hanford Environmental Information System
HGIS	Hanford Geographical Information System
HSP	Health and Safety Plan
IM	Interim Measures
IRA	Interim Remedial Actions
HASM	Hanford Analytical Services Management, WHC
OU	Operable Unit
PMP	Project Management Plan
RCRA	Resource Conservation and Recovery Act of 1976
RDR	Request for Data Review
RFI/CMS	RCRA Facility Investigation/Corrective Measures Study
RIDS	Record Inventory Disposition Schedule
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SAP	Sampling and Analysis Plan
TPA	Tri-Party Agreement (Hanford Federal Facility Agreement and Consent Order)
WHC	Westinghouse Hanford Company
WIDS	Waste Information Database System

**ENVIRONMENTAL RESTORATION TECHNICAL INFORMATION  
GENERATION AND MANAGEMENT PROCESS**

**1.0 Introduction**

**1.1 Purpose**

The purpose of this document is:

- To show the relationships between the remediation activities and the data, records and documents which support meeting the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), Tri-Party Agreement (TPA) and Resource Conservation and Recovery Act of 1976 (RCRA) requirements; and,
- To provide a description of the process of generation and management of the Environmental Restoration (ER) Technical Information.

**1.2 Scope**

The scope of this document is limited to outlining the remediation work, identifying the major classes of documents generated during the process of characterizing the sites, and providing an overview of how data, records and documents interact to meet CERCLA, RCRA and TPA requirements and milestones.

**1.3 References**

Key, KT, 1991, *Hanford Environmental Information System (HEIS) Sample/Data Entry Flow Summary*, WHC-SD-EN-SD-001, Westinghouse Hanford Company, Richland, WA.

WHC, 1992, *Environmental Investigations and Site Characterization Manual*, WHC-CM-7-7, Westinghouse Hanford Company, Richland, WA.

**2.0 Description**

The description of the "*Environmental Restoration Technical Information Generation and Management Process*" (henceforth referred to as the Process) consists of the following areas:

- Basis for the Process: This document first presents the "*RCRA/CERCLA Site Environmental Restoration and Remediation Work Flow*" (henceforth referred to as the Work Flow), providing an



overview of the Environmental Restoration and Remediation project. The Work Flow is an outgrowth of the "*Workflow Model for RI/FS and RFI/CMS Activities*" which is provided as a guideline of activities for CERCLA Remedial Investigation/Feasibility Study (RI/FS) and RCRA Facility Investigation/Corrective Measures Study (RFI/CMS). Thus, the Process is based on this Work Flow.

- Overview of Functional Requirements: A *Functional Diagram*, based on the Function Analysis System Technique (FAST) diagram technique, is introduced in this document to provide an overview of the functional requirements of the Process. The FAST diagram was developed by a Value Engineering Team for the Environmental Restoration Information Management System to integrate the flow of data, documents, and records, and to provide a framework to consistently manage these entities. The Functional Diagram will serve as a focal point for interrelating the processes and flows described in this document.
- Documentation Activities during the Process: The "*Documentation Activities*" during the Process are presented. These required documentation activities are extracted from the Work Flow. Their relationships to the Work Flow and the Functional Diagram is also delineated.
- Description of the Process: Finally, the "*Environmental Restoration Technical Information Generation and Management Process*" is described. It comprises the "*RI/FS (RFI/CMS) Documents Flow*", the "*Record Flow Process*", and the "*Environmental Restoration Technical Information Generation and Management Flow*". The "*RI/FS (RFI/CMS) Documents Flow*" and the "*Record Flow Process*" describe the procedures, from creation to disposition, which a document/record prepared during the Process, must follow. The interrelationships of these procedures through the Functional Diagram are shown. The "*Environmental Restoration Technical Information Generation and Management Flow*" includes, as its element, the "*CERCLA/RCRA HEIS Sample/Data Entry Flow*". The correlation of the latter with the Process through the Functional Diagram is also presented.

These areas are explored in more detail as follows:

## 2.1 RCRA/CERCLA Site Environmental Restoration and Remediation Work Flow

The overall Work Flow is shown in Figure 1 and consists of Operable Unit Designation, Characterization and Remedial Action Selection, Expedited Response Action, the Remedial Action Design, Remedial Action Implementation, RCRA Site Closure terminating in a Remediated Site. Each of these major categories are supported by additional activities as identified in Appendix 1.



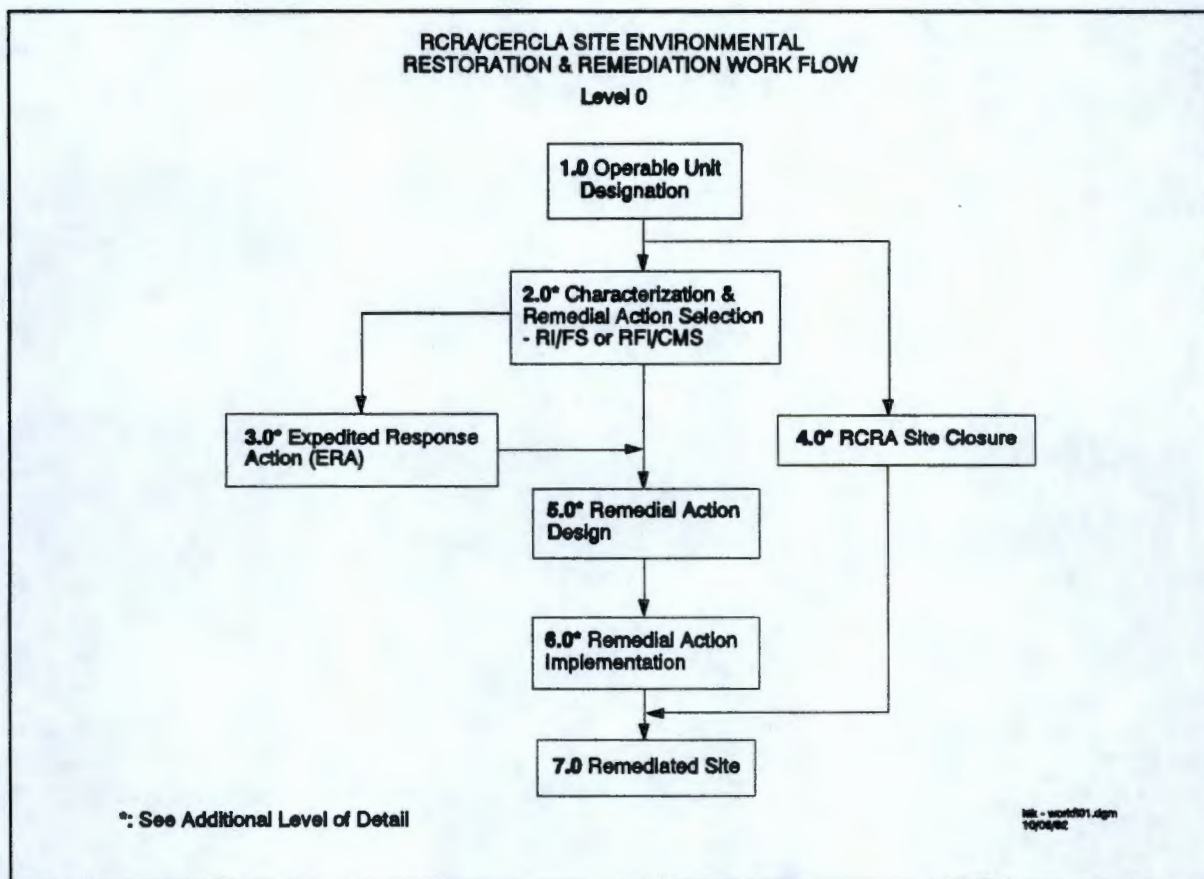
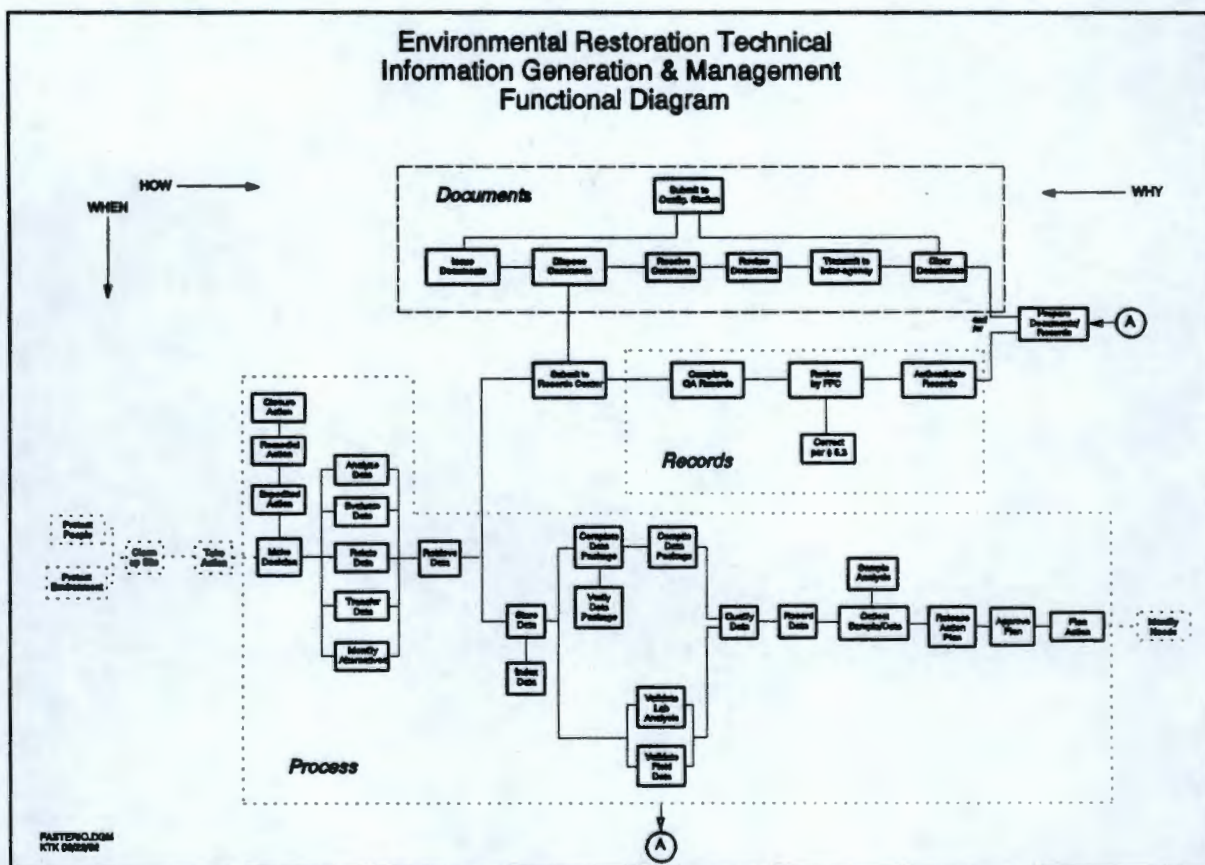


Figure 1, Overall Restoration and Remediation Work Flow

By law and agreement, the work being performed must meet CERCLA, RCRA and TPA requirements. This requires that records must be maintained of all essential activities such that the Record of Decision (ROD) can be defended in court, if necessary, and all subsequent actions related to the decision can be measured through documented evidence as having been carried out per the decision (cf. section 2.3 Work Flow Documentation Activities). In addition, monitoring of the remediated site must be continued for 30 years after agreement has been reached that the ROD has been properly executed and that the actions taken protect the public.

## 2.2 Functional Diagram, ER Technical Information Generation and Management

Figure 2 shows the Functional Diagram for the Process. A full page representation of the diagram can be found on page App. 2 - 3. It is used to integrate the flow of data, documents, and records, and to provide a framework to consistently manage these entities. The diagram uses a value-engineering technique in which each function appears exactly once and is specified simply,



**Figure 2, Functional Diagram  
ER Technical Information Generation & Management**

in terms of a verb and an object. The diagrams may be read in various directions to answer How, When, and Why functions are performed. When the diagram is read from right to left, the question of Why functions are performed is answered. Alternately, when read from left to right, How is answered. Boxes stacked vertically identify functions performed When the function in the left-right sequence is performed.

The current functional requirements for the Process consist of the following areas:

- Document (Control)
- Records (Management)
- Process (Using or Creating Data)

As indicated, documents and/or records will be generated at various stages of the Process (cf. section 2.3 Work Flow Documentation Activities). The outputs of these documents/records at each of these stages are collective-



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ly represented by the sign post A in the Functional Diagram. These outputs will, in turn, serve as inputs, A, to the Document and/or Records blocks for further processing requirements.

### 2.3 Work Flow Documentation Activities

Posts A1, A2, & A3: As indicated on the Functional Diagram, Page App. 2 - 3.

Type	Post	Activities	Work Flow Section #
Scoping	A1	1. Activity Work Plan 2. Health & Safety Environmental Documents & Permits	2.1.2 2.1.3
	A3	1. Scoping Study Results	2.1.6
Remedial Action	A1	1. RI/FS, RFI/CMS: Work Plans 2. Obtain Safety & Environmental Documentation/Permits 3. Project Level Field Sampling Plan (Phase I) 4. Remediation Plan (Remedial Action Design)	2.2 2.3.1,5.3 2.3.2 5.2
	A2	1. RI/RFI Phase I Report (Characterization) 2. FS/CMS Phases I & II Report (Alternatives) 3. Develop Test Plan (Treatability) 4. Secure Permits & Safety Documentation 5. RI/RFI Phase II Report (Treatability) 6. FS/CMS Phase III (Alternatives)	2.3.5 2.4.8 2.5.2 2.5.3 2.5.5 2.6.5
	A3	1. Risk Assessment 2. Record of Decision or RCRA Permit Modification 3. Document Process 4. Report Results	2.3.4 5.4 6.4 6.5
Expedited Action	A1	1. IRA/IM Project Plan 2. Safety & Environmental Permits & Documents	3.6 3.7
	A2	1. IRA/IM Proposal (EE & CA)	3.9
	A3	1. Final Report 2. Record of Decision or RCRA Permit Modification	3.14 5.4
Closure	A1	1. Work Plan for New Data (if needed) 2. Management Action Plan 3. Remedial Activity Plan (Facility Design or Removal)	4.2 4.7 4.10.1
	A2	1. Closure or Post Closure Plans	4.8

Table 1, Work Flow Documentation Activities

The Documentation Activities during the execution of the Process are shown in Table 1. This table contains the types of reports (extracted from the Work Flow) required at each stage of the Process. It correlates the Documentation Activities with the types of Remedial/Restoration Action, and with the section numbers of the Work Flow. It also correlates with the functional requirements by sign posts, A#, as shown in the Functional Diagram in Appendix 2.



## 2.4 ER Technical Information Generation and Management Process

The processes involved in Environmental Restoration Technical Information Generation and Management, as shown Appendix 3, include the "RI/FS (RFI/CMS) Documents Flow", the "Record Flow Process", and the "Environmental Restoration Technical Information Generation and Management Flow". These processes are shown in Appendices 3b, 3c and 3d. The interrelationship of these processes is shown in the Functional Diagram in Appendix 3a, via sign posts A#, B#, C#. The general documentation requirements in these activities are as described in Table 1. These processes are described in further detail as follows:

### 2.4.1 RI/FS (RFI/CMS) Documents Flow

The RI/FS (RFI/CMS) Documents Flow describes the life cycle of RI/FS (RFI/CMS) documents from their creation to their issuance. The flow diagram shown in Appendix 3b is adapted from that of the document "Environmental Investigations and Site Characterization Manual, RI/FS (RFI/CMS) Document Review and Control" (EII 1.9, Rev 1, WHC-CM-7-7), with equivalent functions grouped together for better representation. Each grouped function block is related to the Functional Diagram by sign posts A#, as shown in Appendices 3a and 3b.

### 2.4.2 Record Flow Process

Similarly, the Record Flow Process describes the life cycle of records from their generation to their disposition. The flow diagram shown in Appendix 3c is adapted from that of the document "Environmental Investigations and Site Characterization Manual" (EII 1.6, Rev 3, WHC-CM-7-7), with equivalent functions grouped together for better representation. Each grouped function block is related to the Functional Diagram by sign posts B#, as shown in Appendices 3a and 3c.

### 2.4.3 ER Technical Information Generation and Management Flow

Appendix 3d presents the flow of the activities involved in Environmental Restoration Technical Information Generation and Management. These activities are grouped in functional blocks and are related to the Functional Diagram by sign posts C#, as shown in Appendices 3a and 3d. These activities are described in further detail as follows:

#### 2.4.3.1 Environmental Data Management

The Environmental Data Management organization has the oversight responsibilities for the life cycle of Environmental Restoration Technical Information Generation and Management. Aspects of these responsibilities include



defining the requirements for the reports to be generated and overseeing the life cycle of the documents from their origination to their disposition to the designated depositories.

#### **2.4.3.2 Review Background**

For a particular RI/FS or RFI/CMS project, the technical lead provides the background information to assess the availability of the data and the data to gather. This is accomplished by a review of existing information in Waste Isolation Database System (WIDS) and other known related reference sources.

#### **2.4.3.3 RI/FS or RFI/CMS Scoping Studies**

Before the preparation of the RI/FS or RFI/CMS plans, scoping studies will be conducted to determine whether an Expedited Response Action is required for a particular operable unit. The scoping studies also determine whether the available data are sufficient for generating the RI/FS or RFI/CMS work plans. The documents generated, together with the related Work Flow Diagram section numbers are as shown in Table 1, Type Scoping.

As the scoping studies are completed, the RI/FS or RFI/CMS plans are generated under the direction of the Technical Coordinator for the Operable Unit. All documents generated are routed to the pertinent Record Center.

#### **2.4.3.4 Documents**

The RI/FS or RFI/CMS Plan is finalized with the conclusion of the scoping studies and includes Data Management Plans, Work Plans, Sample/Analysis Plans, Site Characterization Plans, and other plans. The documents generated are routed to the pertinent Record Center.

#### **2.4.3.5 HGIS Data**

Hanford geographical data can be taken at a point (eg. field samples) or digitized from a photograph. The required data must conform to the structure of Hanford Geographical Information System (HGIS) databases and the HGIS standards as defined in the *HGIS Technical Manual (in development)*. These data will be used for the generation of maps or derived map products, to perform analyses, and to supply data to other reports or users.

#### **2.4.3.6 HEIS Data**

Certain Hanford Environmental Information System (HEIS) data will result from the preparation and the implementation of the RI/FS or RFI/CMS data



management plans. The required data, either existing or generated by the implementation of the plans, must conform to the Subject Areas of the HEIS, before being input into the HEIS database. These data will be used for the generation of data reports, and input to various analysis models (groundwater, risk assessment, etc.) or to supply data to other reports.

#### 2.4.3.7 Other Data

The preparation and implementation of the RI/FS plans could also generate or identify data other than those of HGIS or HEIS. These data may be contained in records, such as log books, custody sheets, etc. The contents of these records may reside on some databases. The data reports of the Other Data are routed to the pertinent Record Center.

#### 2.4.3.8 Plan Implementation

The implementation of the RI/FS or RFI/CMS plans initiates three categories of actions or combination of these actions: Expedited Response Action, Remedial Action and Closure Action. These actions all generate documents to be managed. The documents generated are forwarded to the pertinent Record Center for processing.

##### Expedited Response Action:

This action is detailed in section 3.0 of the Work Flow. The documents generated in this action are as shown in Table 1, Type Expedited Action.

##### Remedial Action:

This action is detailed in sections 2.0, 5.0, 6.0 and 7.0 of the Work Flow. It is to be noted that, during the course of the Remedial Action, Expedited Response Actions might be taken. In such instances, the documentation requirements of the Expedited Response Action will take precedence. The Remedial Action generates documents on such topics as Characterization, Design, Record of Decision, and Records (such as Log books, Custody sheets, others). The characterization activities will generate HEIS data as well as Other data. The HEIS data (cf. section 2.4.3.6) include data from the investigations of air, biota, groundwater, soil gas, etc. For more detailed description of HEIS sample/data flows, consult "*CERCLA/RCRA HEIS Sample/Data Entry Flow (WHC-SD-EN-SD-001)*." A copy of the HEIS sample/data flow chart and its relationship to the Functional Diagram are attached for reference (cf. Appendix 4, section 3.7). The Other data (cf. section 2.4.3.7) include data from risk assessments (exposure, toxicity, modeling, HGIS studies etc), and from other non-HEIS, non-HGIS Records. The Other data may reside as a record and/or on a database, or in a computer file. The



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documents generated in this action are as shown in Table 1, Type Remedial Action.

**Closure Action:**

This action is detailed in section 4.0 of the Work Flow. Site closure generates documents to be forwarded to Record Center. The documents generated in this action are as shown in Table 1, Type Closure.

#### **2.4.3.9 Record Center**

Record Centers for processing technical information documenting remediation activities include the Environmental Data Management Center (EDMC) and other record centers maintained for the Environmental Restoration Engineering (ERE) and the Environmental Field Services (EFS) organizations.

The pertinent Record Center receives documents and/or records generated at various stages of the Process, including documents classified as Administrative Record (AR) documents and/or quality assurance (QA) records. The Environmental Data Management organization will be informed of the technical information generated and/or processed through routine performance reports. Functions performed at the Record Centers, under established WHC procedures, include, but are not limited to, the following:

- Configuration management/engineering release for environmental engineering documents
- QA record processing
- Compilation and maintenance of the AR files and management of the public information repositories
- Managing one-of-a-kind geotechnical samples and associated documentation
- Dispositioning completed documents/records to the pertinent IRM records holding area

### **3.0 Appendices**

Appendices 1 and 2, taken together, discern the relationships between the remediation activities and the data, records and documents which support meeting the CERCLA, TPA and RCRA requirements.

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1. Appendix 1, RCRA/CERCLA Site Environmental Restoration and Remediation Work Flow
2. Appendix 2, Work Flow Documentation Activities and the related Functional Diagram

Appendices 3a - 3d, as a group, provide a description of the process of generation and management of the Environmental Restoration (ER) Technical Information.

3. Appendix 3a, Functional Diagram, the interrelationship of the ER Technical Information Generation and Management processes
4. Appendix 3b, RI/FS (RFI/CMS) Documents Flow
5. Appendix 3c, Record Flow Process
6. Appendix 3d, Environmental Restoration Technical Information Generation and Management Flow

Appendix 4 provides an expanded view of the box, the CERCLA/RCRA HEIS Sample/Data Entry Flow, in the Environmental Restoration Technical Information Generation and Management Flow, Appendix 3d.

7. Appendix 4, CERCLA/RCRA HEIS Sample/Data Entry Flow and the related Functional Diagram

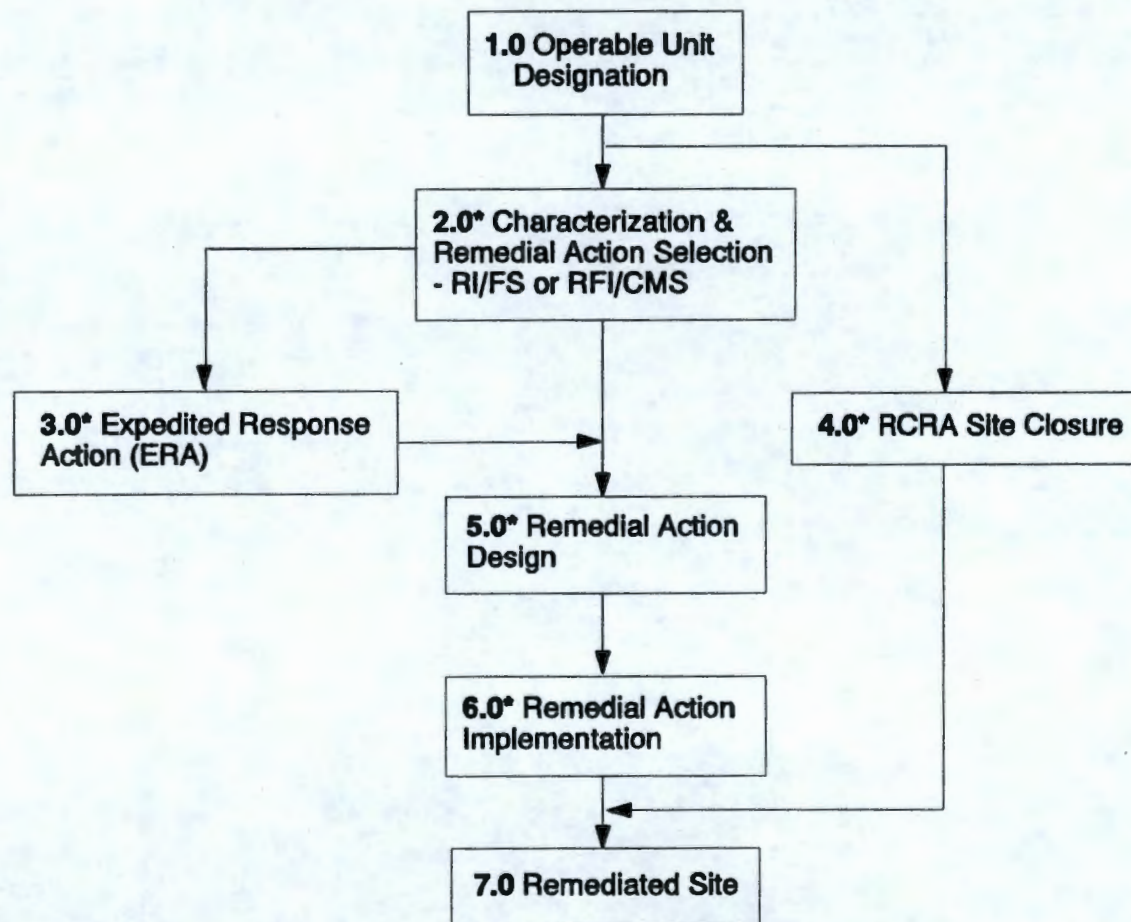


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**3.1 Appendix 1, RCRA/CERCLA Site Environmental  
Restoration and Remediation Work Flow**

**RCRA/CERCLA SITE ENVIRONMENTAL  
RESTORATION & REMEDIATION WORK FLOW**

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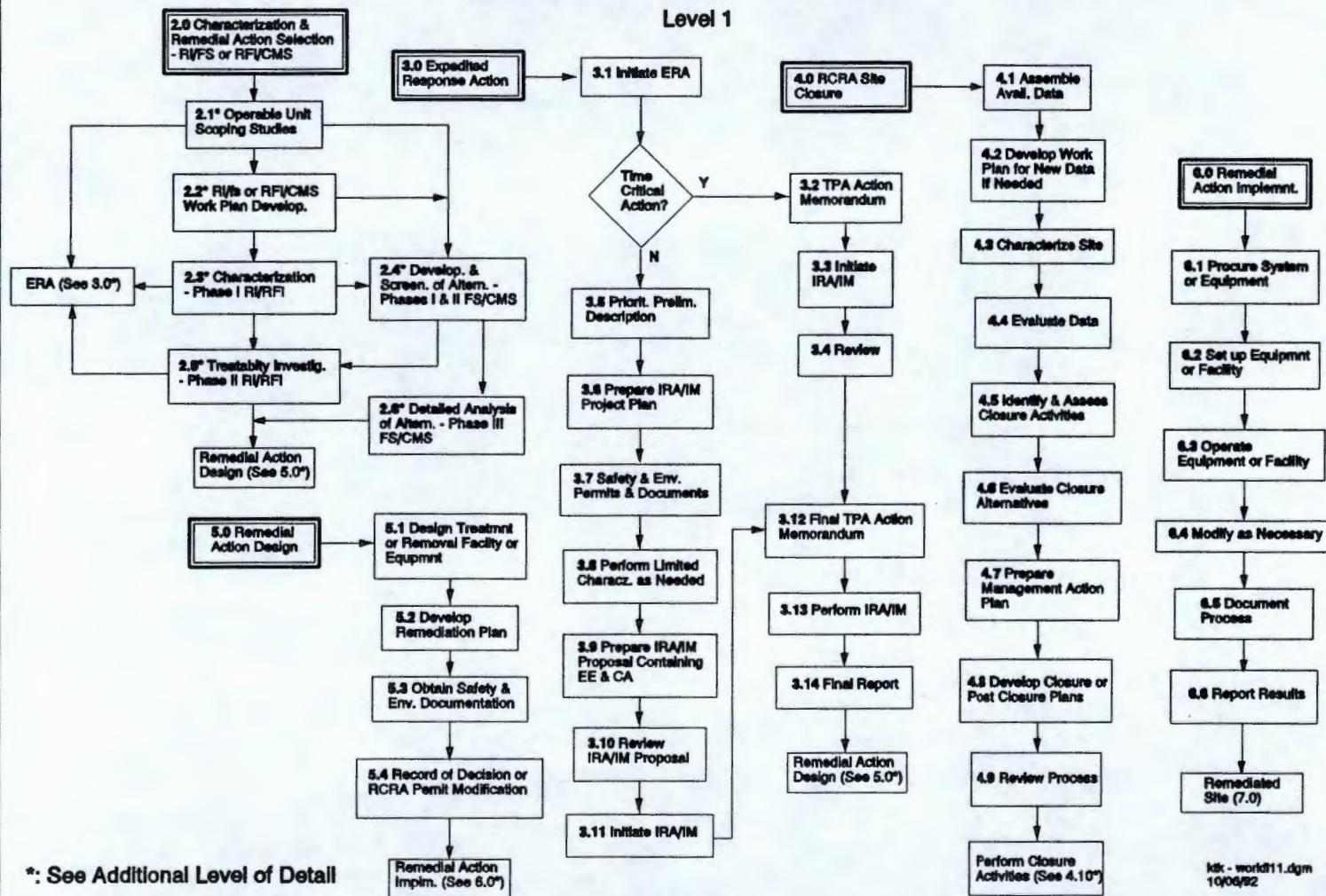
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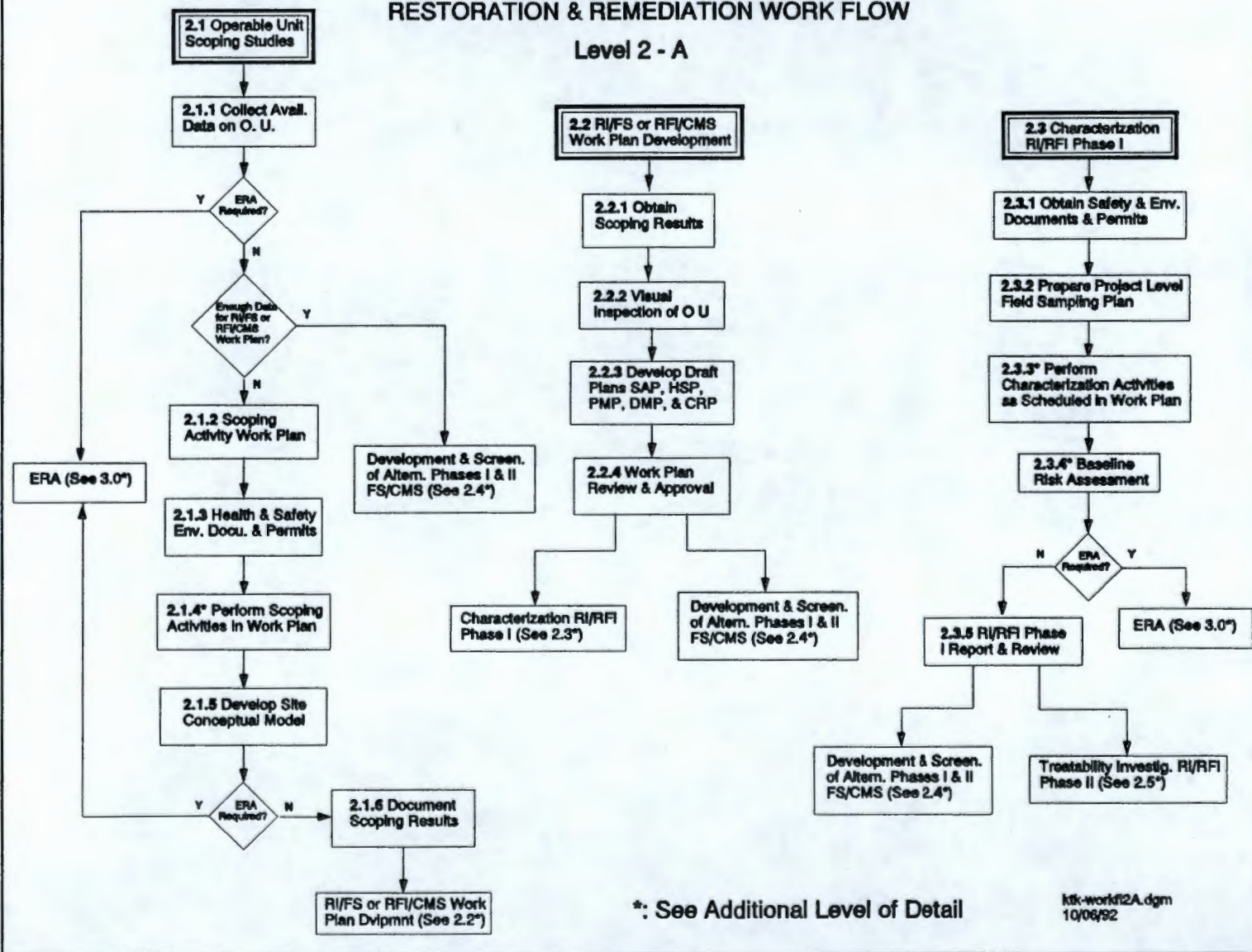
# RCRA/CERCLA SITE ENVIRONMENTAL RESTORATION & REMEDIATION WORK FLOW

## Level 1



# RCRA/CERCLA SITE ENVIRONMENTAL RESTORATION & REMEDIATION WORK FLOW

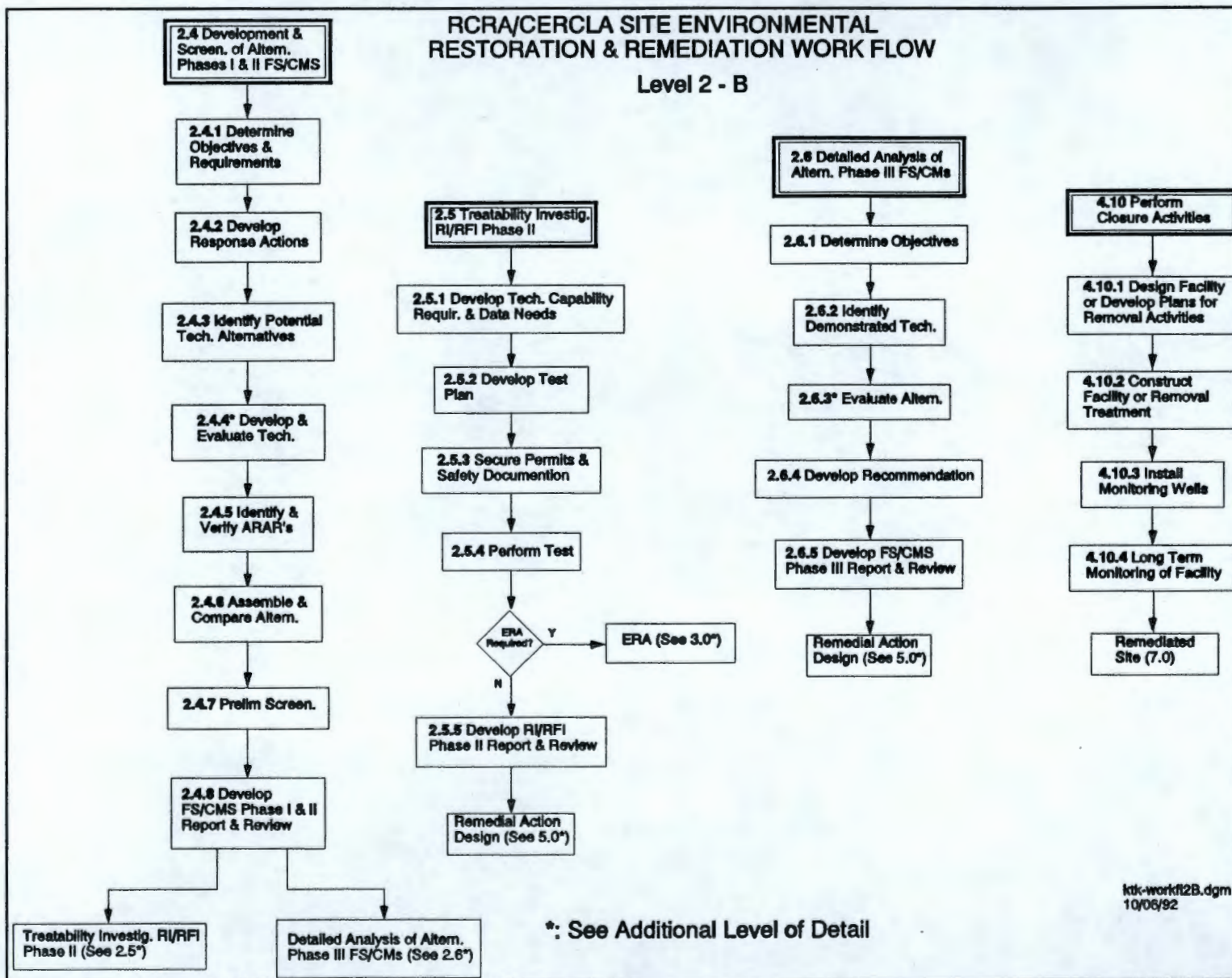
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# RCRA/CERCLA SITE ENVIRONMENTAL RESTORATION & REMEDIATION WORK FLOW

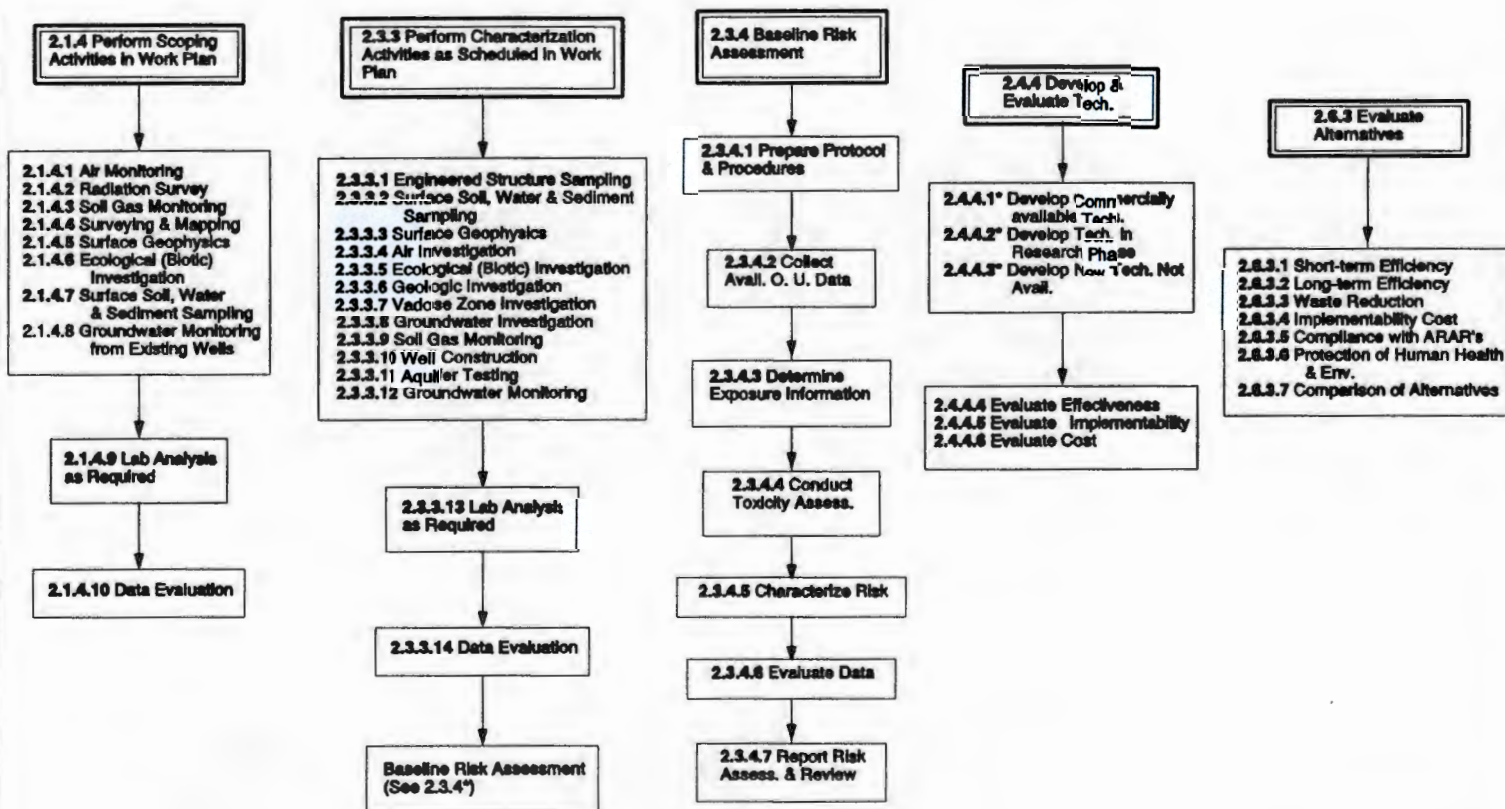
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# RCRA/CERCLA SITE ENVIRONMENTAL RESTORATION & REMEDIATION WORK FLOW

## Level 3



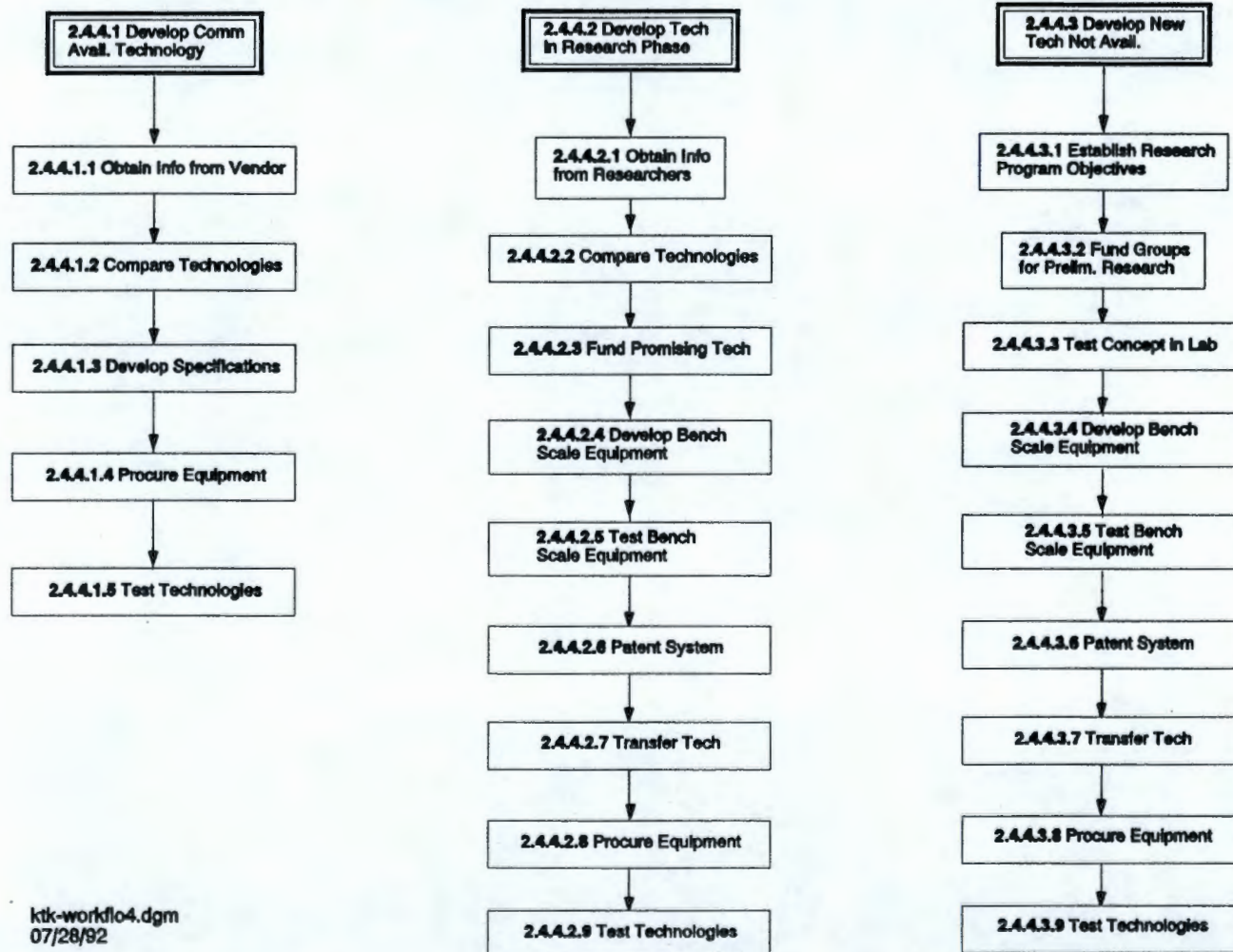
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# RCRA/CERCLA SITE ENVIRONMENTAL RESTORATION & REMEDIATION WORK FLOW

## Level 4



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**3.2 Appendix 2, Work Flow Documentation Activities  
and the related Functional Diagram**



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Work Flow Documentation Activities  
and their Relationships to  
Environmental Restoration  
Information Generation and Management Process  
Functional Diagram

Posts A1, A2, & A3: As indicated on the Functional Diagram, Page App. 2 - 3.

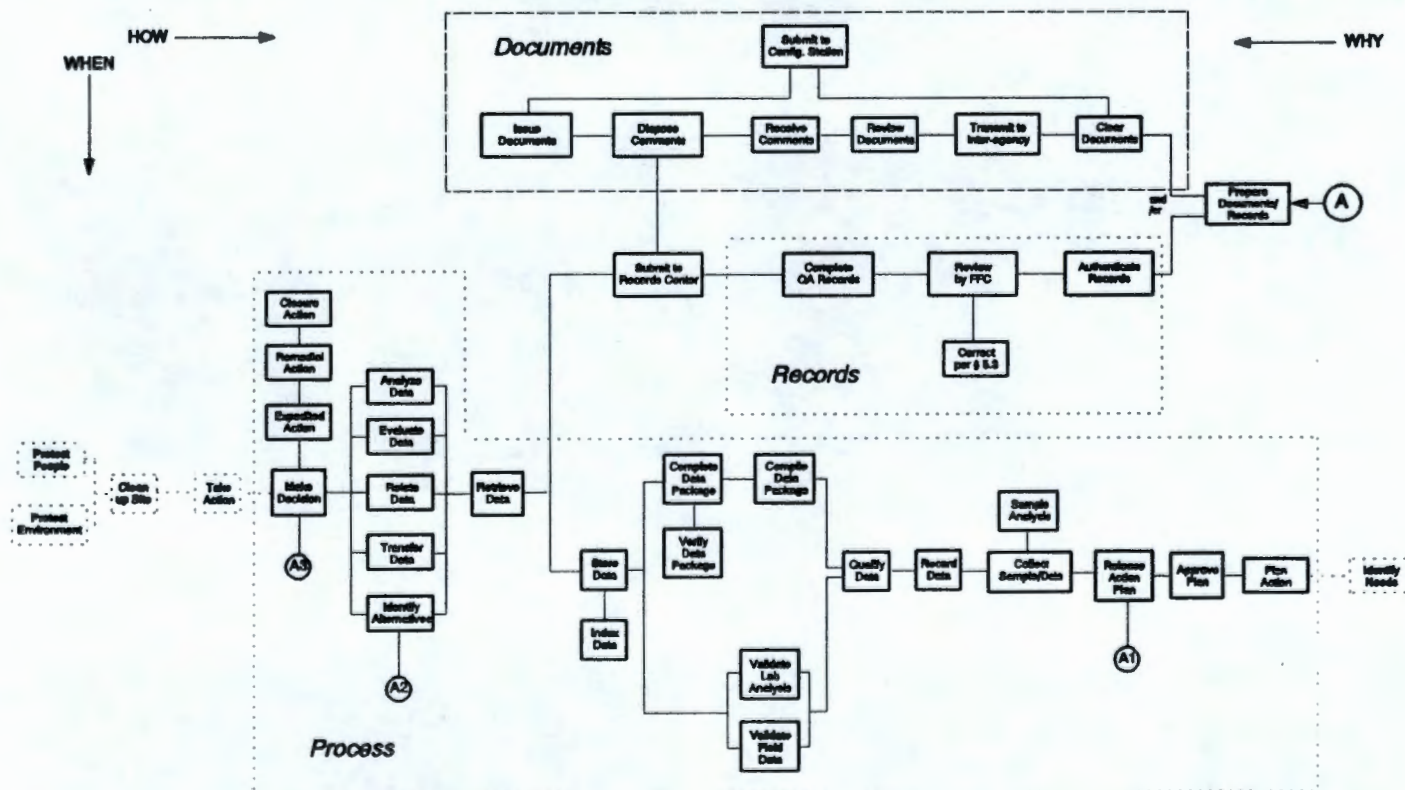
Type	Post	Activities	Work Flow Section #
Scoping	A1	1. Activity Work Plan 2. Health & Safety Environmental Documents & Permits	2.1.2 2.1.3
	A3	1. Scoping Study Results	2.1.6
Remedial Action	A1	1. RI/FS, RFI/CMS: Work Plans 2. Obtain Safety & Environmental Documentation/Permits 3. Project Level Field Sampling Plan (Phase I) 4. Remediation Plan (Remedial Action Design)	2.2 2.3.1,5.3 2.3.2 5.2
	A2	1. RI/RFI Phase I Report (Characterization) 2. FS/CMS Phases I & II Report (Alternatives) 3. Develop Test Plan (Treatability) 4. Secure Permits & Safety Documentation 5. RI/RFI Phase II Report (Treatability) 6. FS/CMS Phase III (Alternatives)	2.3.5 2.4.8 2.5.2 2.5.3 2.5.5 2.6.5
	A3	1. Risk Assessment 2. Record of Decision or RCRA Permit Modification 3. Document Process 4. Report Results	2.3.4 5.4 6.4 6.5
Expedited Action	A1	1. IRA/IM Project Plan 2. Safety & Environmental Permits & Documents	3.6 3.7
	A2	1. IRA/IM Proposal (EE & CA)	3.9
	A3	1. Final Report 2. Record of Decision or RCRA Permit Modification	3.14 5.4
Closure	A1	1. Work Plan for New Data (if needed) 2. Management Action Plan 3. Remedial Activity Plan (Facility Design or Removal)	4.2 4.7 4.10.1
	A2	1. Closure or Post Closure Plans	4.8

Sign Posts Cross-reference

(A) : Documentation Activities Table

# Environmental Restoration Technical Information Generation & Management Functional Diagram

(As Related to Work Flow Documentation Activities)



FASTDOC2.DGM  
KTK 08/22/82



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**3.3 Appendix 3a, Functional Diagram,  
the interrelationship of the ER Technical Information  
Generation and Management processes**

Sign Posts Cross-references:

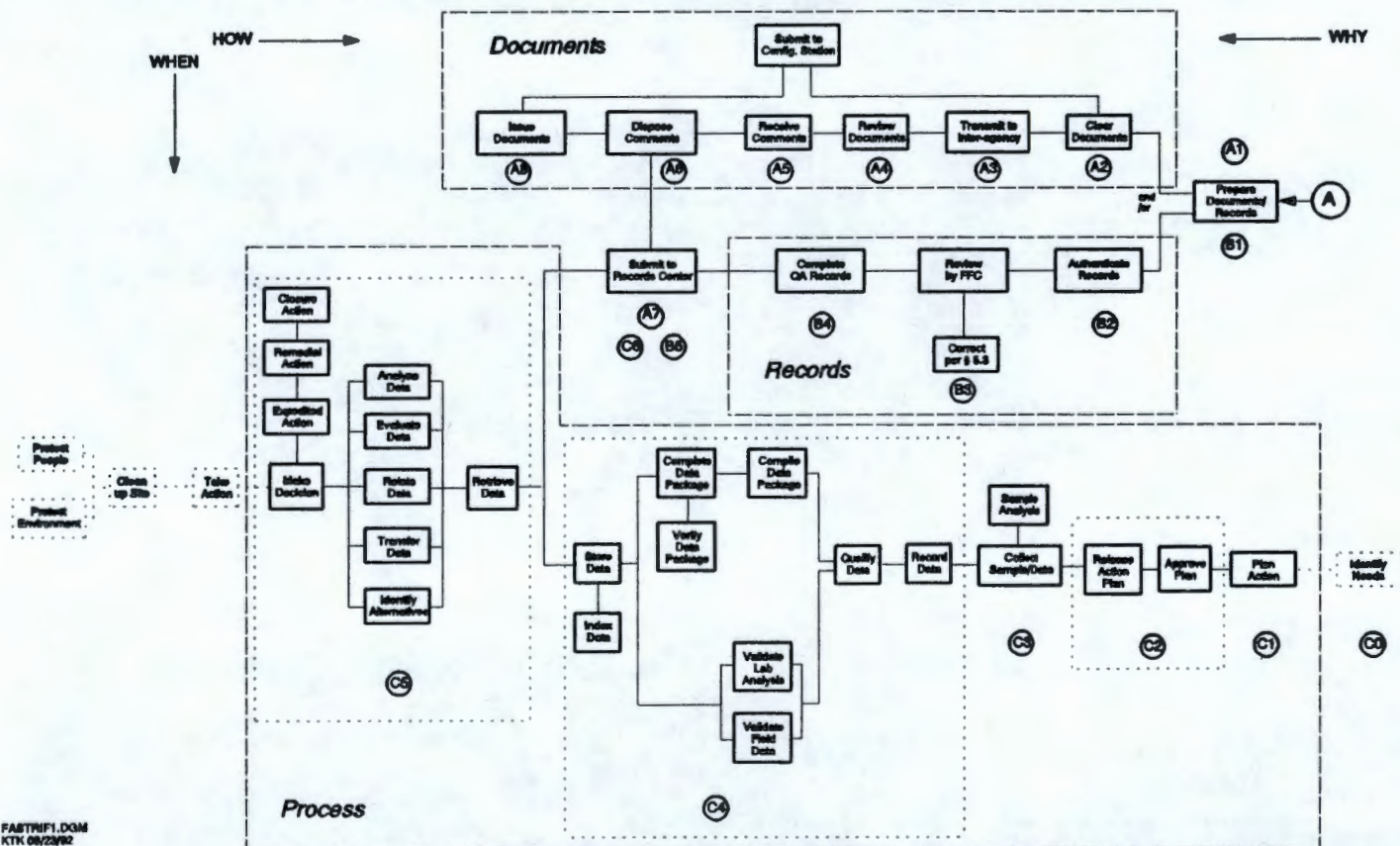
(A) : RI/FS Documents Flow (App. 3b)

(B) : Record Flow (App. 3c)

(C) : Tech Info G & M Flow (App. 3d)

(As Related to ER Technical Information Generation & Management Processes)

# Environmental Restoration Technical Information Generation & Management Functional Diagram





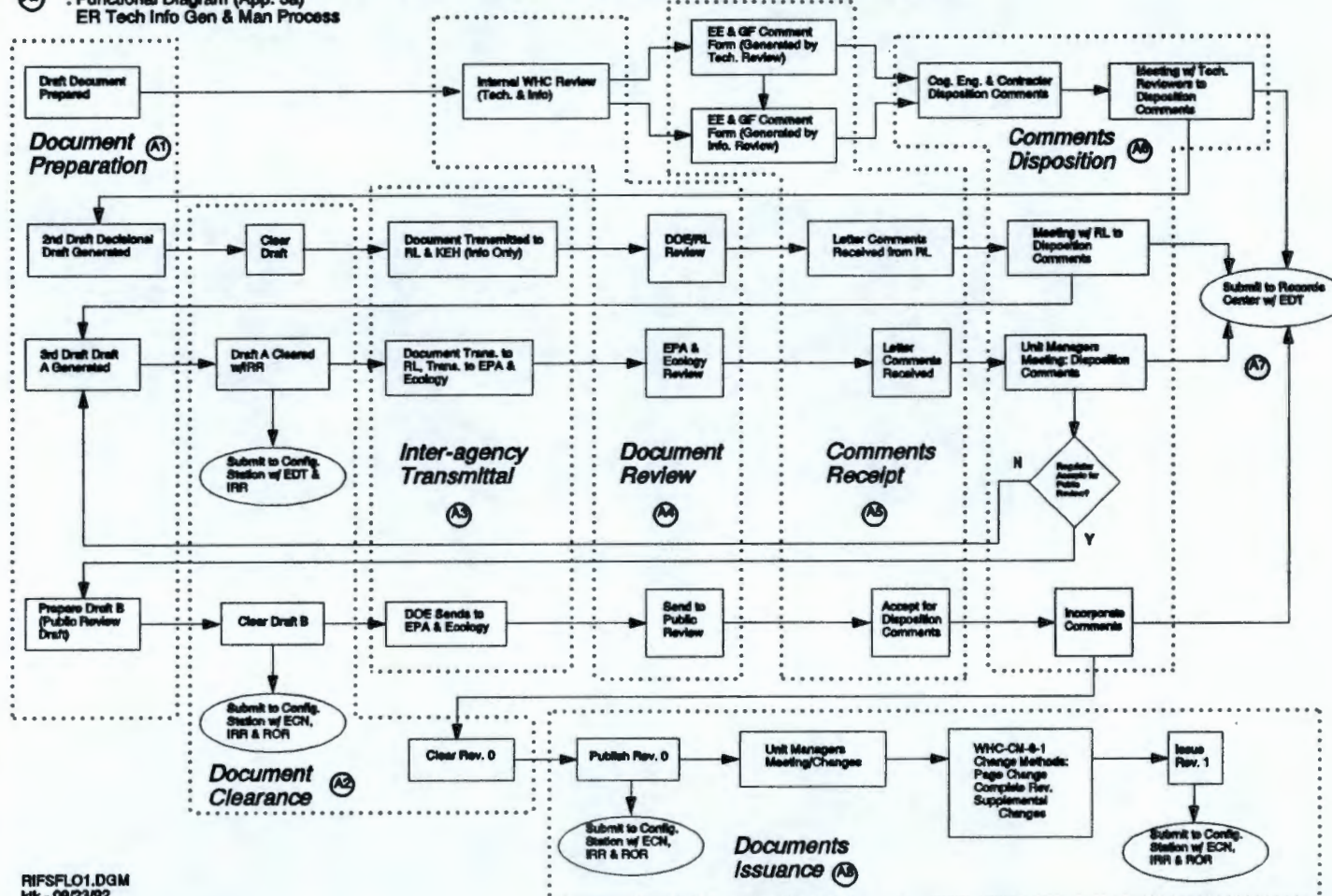
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### **3.4 Appendix 3b, RI/FS (RFI/CMS) Documents Flow**

Sign Posts Cross-reference

(A1) : Functional Diagram (App. 3a)  
ER Tech Info Gen & Man Process

## RI/FS (RFI/CMS) Documents Flow





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### 3.5 Appendix 3c, Record Flow Process

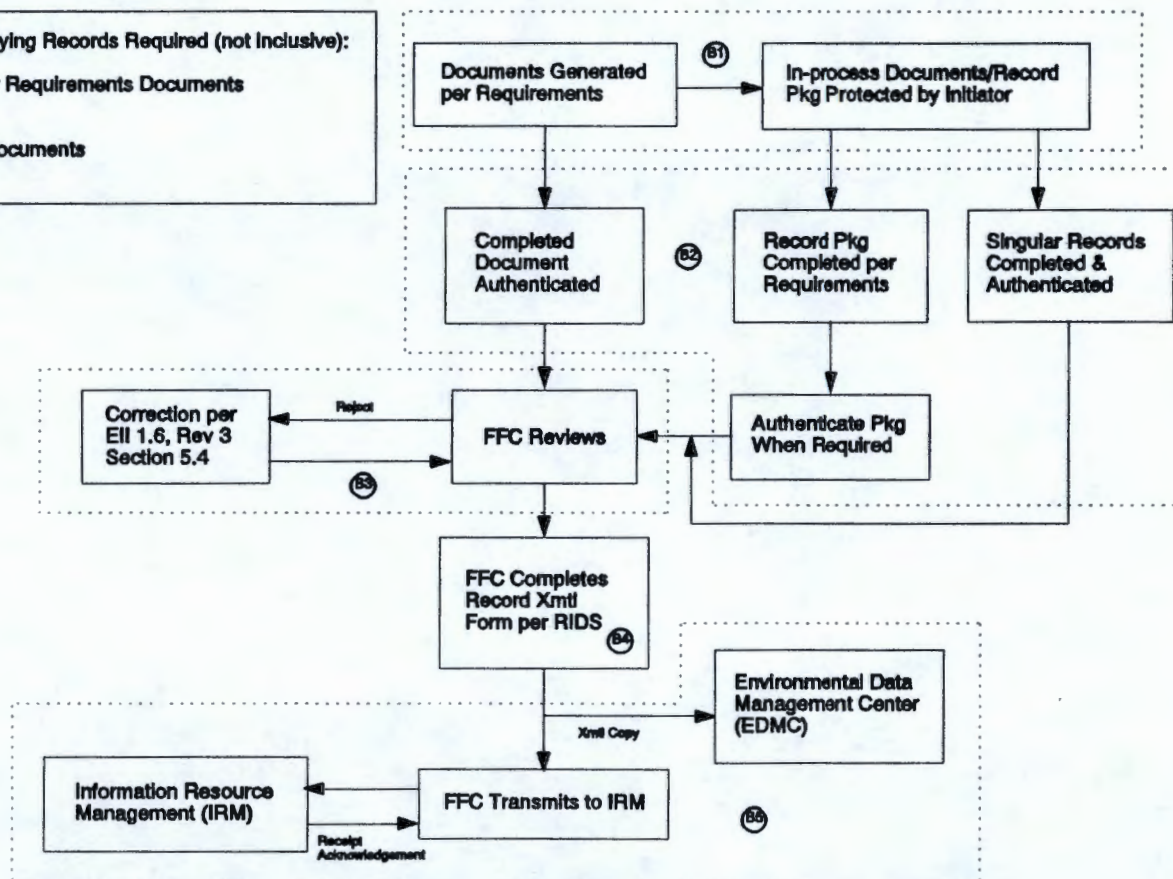
Sign Posts Cross-reference

(B#) : Functional Diagram (App. 3a)  
ER Tech Info Gen & Man Process

## Record Flow Process

Requirements Specifying Records Required (not inclusive):

- WHC Upper Tier Requirements Documents
- Work Plans
- EII's
- Procurements Documents
- Specifications



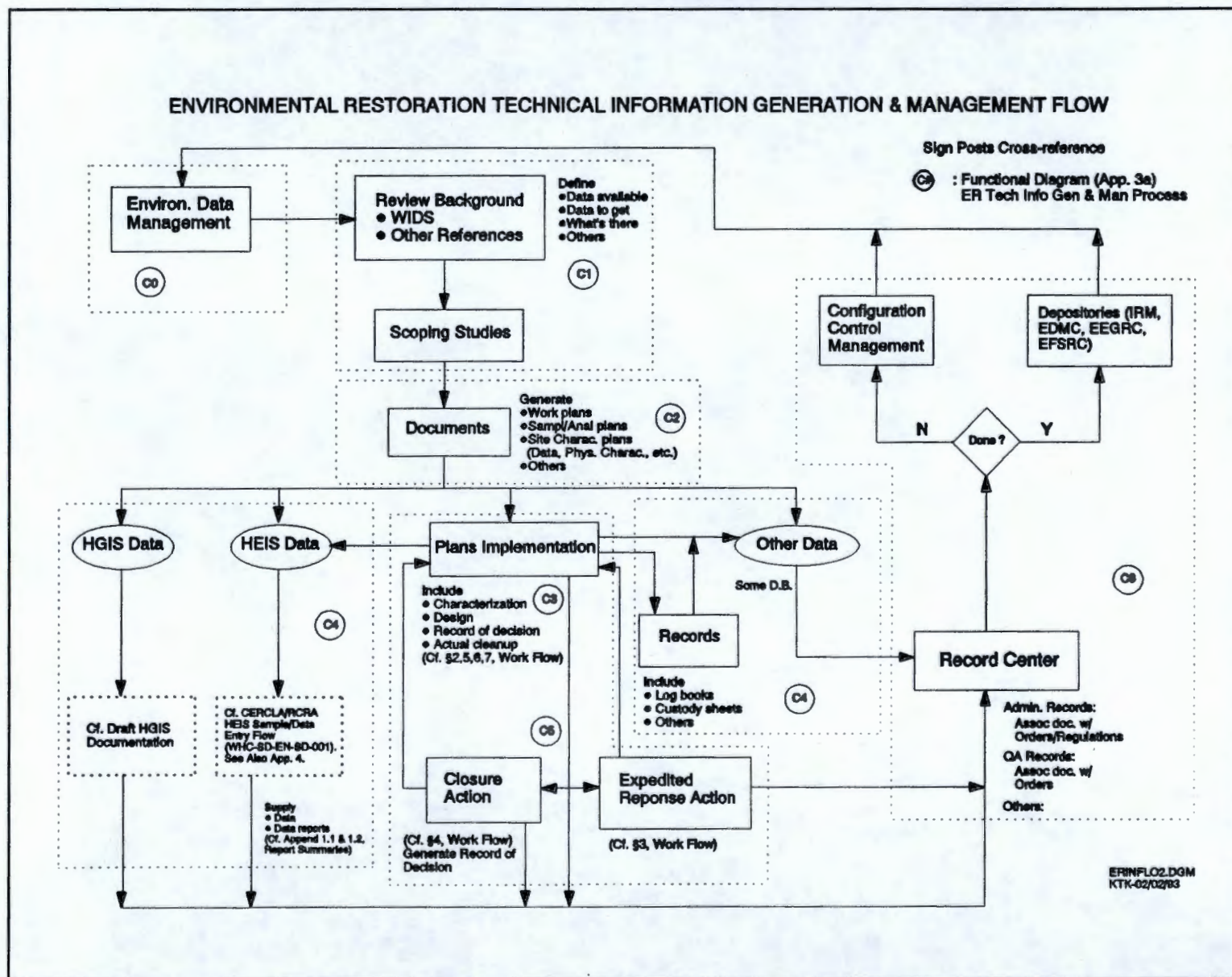
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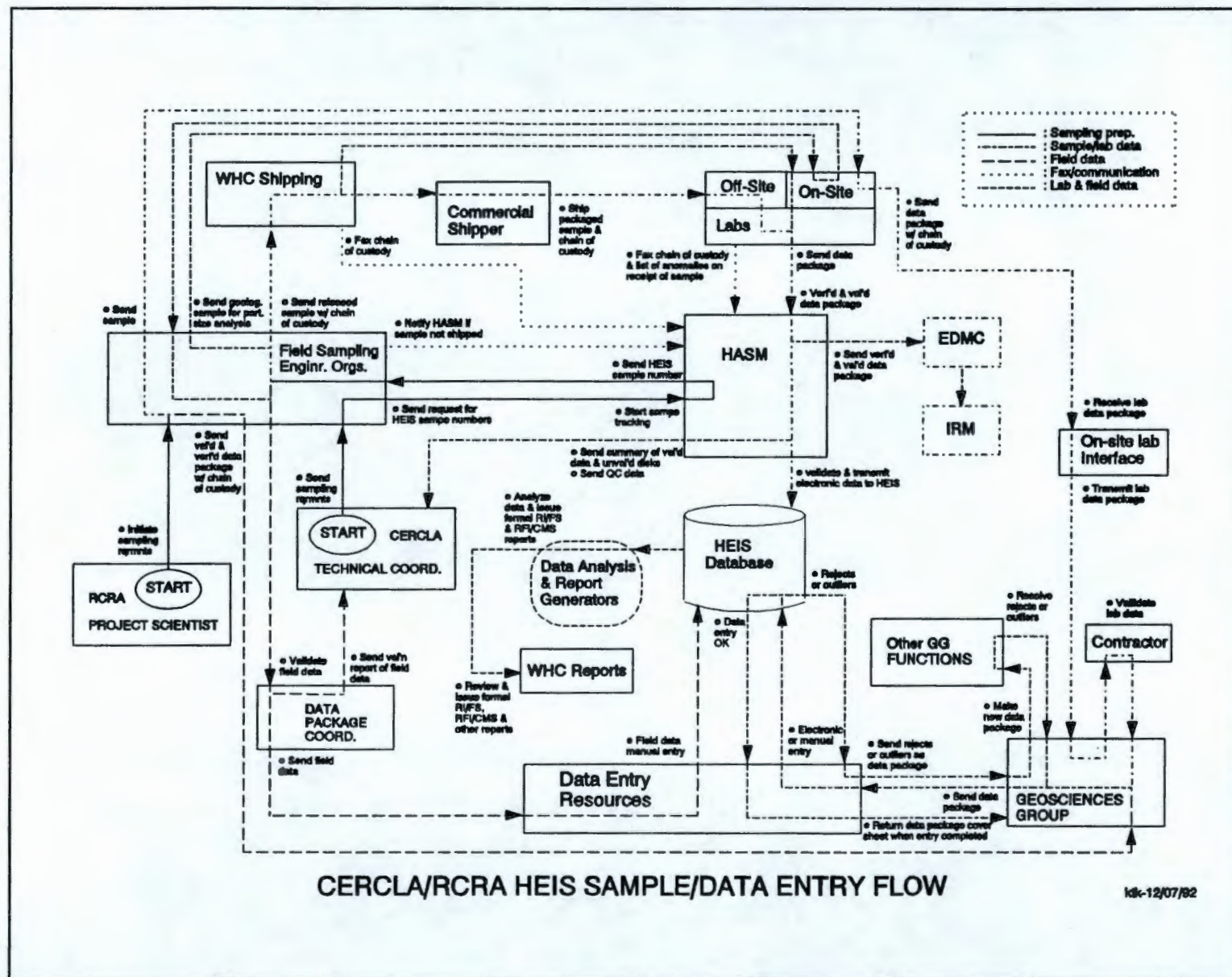
### 3.6 Appendix 3d, ER Technical Information Generation and Management Flow





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**3.7 Appendix 4, CERCLA/RCRA HEIS Sample/Data Entry Flow  
and the related Functional Diagram**



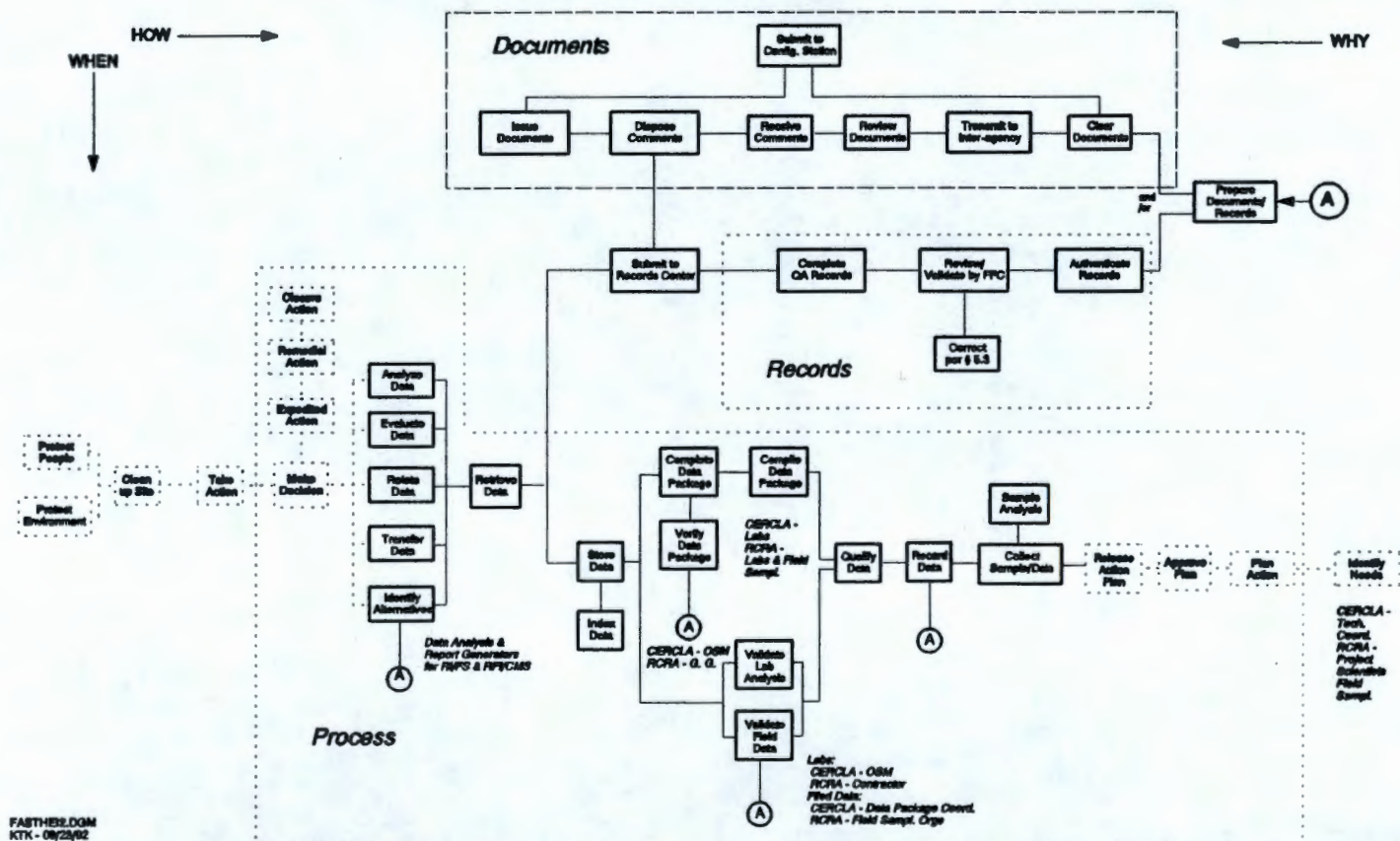
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# Environmental Restoration Technical Information Generation & Management Functional Diagram

(As Relate to HEIS Sample/Data Entry Flow)



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